
*"Far away in northwestern Montana,
hidden from view by clustering mountain-peaks,
lies an unmapped corner -- the Crown of the Continent."*

George Bird Grinnell wrote those words in 1901. Today, Glacier National Park remains virtually as it was one hundred years ago: a vast wilderness of ice, forest, mountain, and lake, preserve for watersheds, habitat for wildlife, and a place of rest and reflection for all who journey there to see its marvelous landscapes. The only substantial evidence of human presence in the region is a narrow road approximately 50 miles long traversing the heart of the park: the Going-to-the-Sun Road.

Construction of Going-to-the-Sun Road was, by any standard, a huge undertaking. Even today, visitors to the park marvel at how such a road could have been built, and how well it fits into its spectacular setting. The Road's traverse of Logan Pass was completed in 1932, the culmination of some two decades of surveying, planning, and construction. The Road is recognized as a monumental engineering feat and is designated as a National Civil Engineering Landmark and a National Historic



Figure 1: Hugging the mountainside as it disappears in the distance, Going-to-the-Sun Road snakes through the spectacular heart of Glacier.

Introduction

Landmark. It is one of the most scenic roads in North America. Construction of the Road forever changed the way visitors would experience Glacier National Park, because they could now drive through sections of the park and experience unique vistas that previously had taken days of horseback riding to see.

Although Going-to-the-Sun Road was officially opened in 1932 with a dedication ceremony in 1933, no portion of the Road was considered to be in finished condition. The most recently constructed segments, those completed between 1928 and 1933, were scheduled for extensive improvements, which included widening, gravel surfacing, construction of additional stone masonry retaining walls and guardwalls, new bridges, slope stabilization, and drainage improvements. For earlier roadway segments -- which were often characterized by narrow, tight curves and primitive wooden culverts and bridges -- complete reconstruction to upgraded road standards was planned. Ultimately, the entire length of the Road was to be paved with asphalt, replacing the initial crushed rock surface.

Considerable work on these improvements took place during the 1930s, and the first asphalt pavement appeared on the Road in 1938. By the onset of World War II, much of the planned improvement and reconstruction on the lower Road was near completion, and all rehabilitated sections were surfaced with either a bituminous chip seal treatment or bituminous pavement. Only one major element of the road reconstruction program had not been completed: the ten-mile-long western approach to Logan Pass. But the war years interrupted the reconstruction and improvement work, and significant work on the Road would not be resumed until the early 1950s.

Improvements on the Logan Pass section of the Road during the 1950s were at a lesser scale than those accomplished prior to the War. Large-scale road widening did not occur; instead, additional width was obtained by filling cutslope ditches and increasing fill slopes by casting material over the side. Portions of the Road in this section would remain narrower than the standard 22-foot width that had been established. By 1957, the major rehabilitation of the Logan Pass section was considered to be substantially complete, and an asphalt pavement surface was finally installed on the section in that year.

After 1957, reconstruction and rehabilitation projects on Going-to-the-Sun Road were infrequent and limited in scope. Due in part to limited funding, efforts were concentrated on routine maintenance and on damage repair (such as after the 1964 flood). This reduced level of maintenance activities, combined with the area's severe

weather conditions, avalanches, and increasing visitor use, has contributed to major deterioration of the roadway, guardwalls, retaining walls, and drainage structures.

Prior to 1982, funding for Glacier National Park road repairs was minimal and came entirely from the park's annual operating budget. In 1982, Congress passed the Surface Transportation Assistance Act, which included funding for federal road reconstruction projects. Thereafter, the National Park Service (NPS), in partnership with the Federal Highway Administration (FHWA), established a road improvement program. Since 1982, seven major road rehabilitation projects have been funded in the park. Approximately \$18 million has been spent to reconstruct 20 miles of Going-to-the-Sun Road. The completed 20 miles have been mostly in lower sections of the Road; less than one mile of the high-mountain section has been completed.

Because of its unique character, the challenges involved in its design and construction, and its cultural and historical significance, Going-to-the-Sun Road has received several distinctions. It was placed on the National Register of Historic Places in 1983, declared a National Historic Civil Engineering Landmark in 1985, and listed as a National Historic Landmark in 1997.

When the final segment of original construction was completed in 1933, fewer than 40,000 cars per year used the Road. Today vehicle volume has increased to nearly 500,000 vehicles per year carrying approximately 2,000,000 park visitors. This traffic load has placed demands on the Road that were not anticipated in the original design.



Figure 2: A testament to the skill and vision of engineers and builders, Going-to-the-Sun Road carves its way through boulder fields and alpine forests. The Road has withstood the changing of the seasons in Glacier for nearly 70 years.

Introduction

Going-to-the-Sun Road is now the topic of much discussion and study because of the deteriorating condition of this historic roadway and its need for rehabilitation. Because of the Road's setting, historic, cultural, and regional economic significance, and high alpine sections, rehabilitation will be difficult to achieve without impacts to visitor use, the environment, and local economies. This engineering study addresses the many factors that must be included in rehabilitating the Road, including needed improvements, engineering constraints, costs, and construction durations. The location of the Road is shown below in Figure 3.

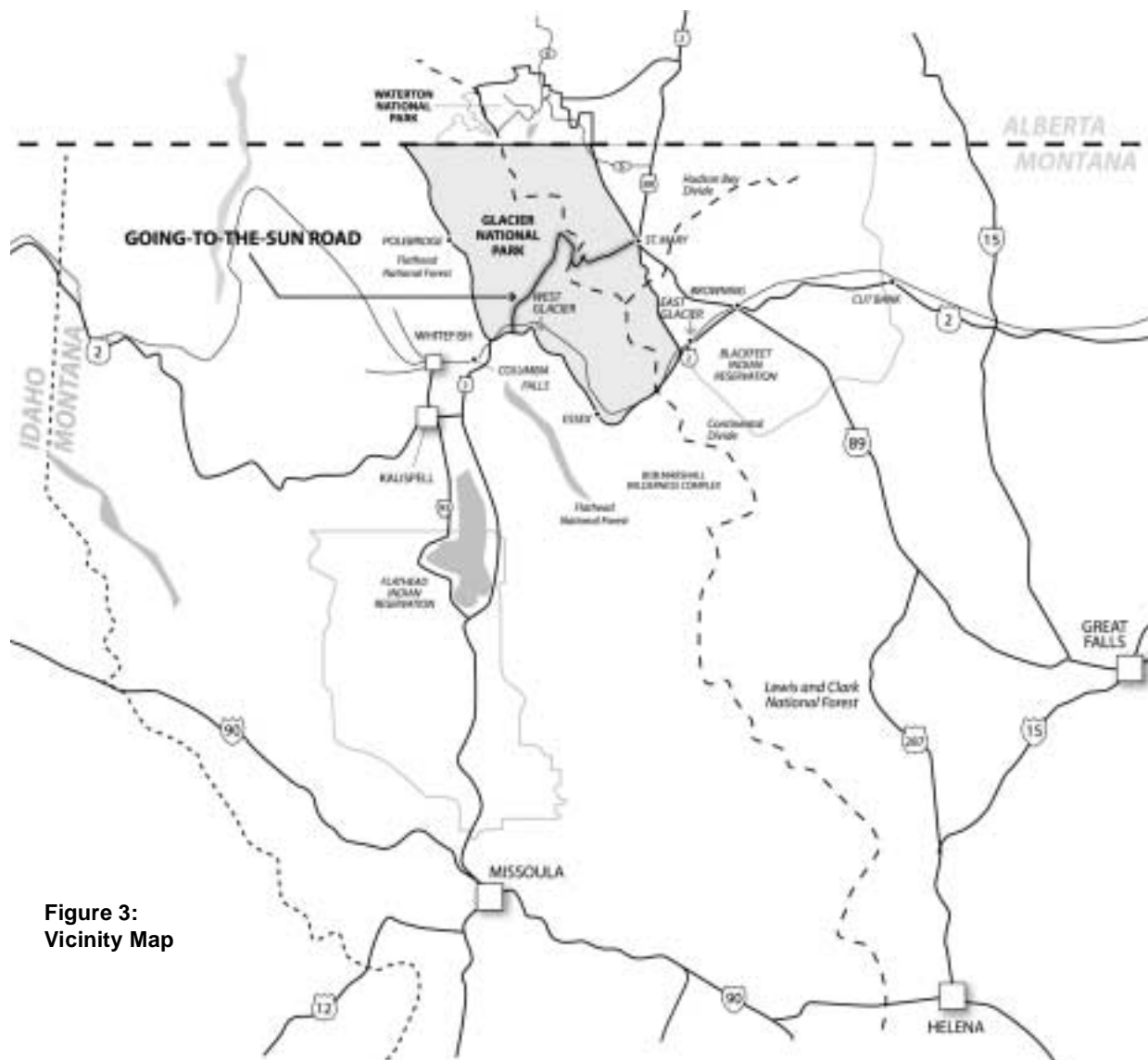


Figure 3:
Vicinity Map

Purpose of the Engineering Study

This engineering study has been prepared in accordance with the intent of Congress as expressed in Public Law 105-2177 (The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999), October 21, 1998 to develop an engineering study for the Road. The purpose of this study is to supply the Going-to-the-Sun Road Advisory Committee (the Committee), as established by the Secretary of the Interior, with the tools necessary to make recommendations to the NPS concerning the rehabilitation of the Road. These tools, in the form of alternatives, costs, construction durations, and specific recommendations, will provide focus so that the Committee can make knowledgeable recommendations based on desired outcomes for the Road. The alternatives and recommendations developed for this study will highlight and address the main issues at stake, as well as give detailed information on the most efficient and effective rehabilitation solutions.

Relationship to Other Studies

The *Going-to-the-Sun Road Socioeconomic Study*, *Transportation and Visitor Use Study*, and *Cultural Landscape Study* are being developed concurrently with this study but as separate documents. Each one addresses other topics critical to the planning and design for rehabilitation of the Road and the management of the park. These documents are relevant to this engineering report because of the sensitive nature of the roadway. Any rehabilitation of the Road will require special attention to socioeconomic, transportation, and visitor use impacts during and after construction periods, as well as the cultural, historical, and regional economic significance of the Road and related roadside features. Conversely, any plans recommended for the transportation and visitor use system must consider potential construction activities on the Road.

General Management Plan and Advisory Committee

In 1999 Glacier National Park approved a *Final General Management Plan and Environmental Impact Statement* (GMP). The GMP is intended to guide the management of Glacier for the next twenty or more years.

The GMP focused on eight critical issues and alternatives for addressing those issues. One of these issues was the preservation of the Road. It was recognized that

significant work would be required to rehabilitate the roadway and that this work would almost certainly affect visitor use along the Road. The GMP concluded that the preferred alternative for addressing this issue was for the “National Park Service to reconstruct the Road to preserve its historic character and significance; complete the needed repairs before the Road could fail; minimize impacts on natural resources, visitors, and the local economy; and minimize the reconstruction costs.” This engineering study provides the first step in determining how to best rehabilitate the Road.

The enabling legislation that resulted in this study also created the Going-to-the-Sun Road Advisory Committee. This is a Federal advisory committee established under authority of the Secretary of the Interior. The purpose of the Committee is to “advise the National Park Service (NPS) in the development of alternatives for reconstruction of the Road, focusing on road condition and reconstruction strategies, including scheduling, cost and measures to mitigate impacts on visitors and local economies.” The Committee consists of seventeen members representing the various interests concerned with the Road including individuals from:

- Tribal governments
- Local governments
- Local businesses
- State government
- Tourism organizations
- Environmental organizations
- Historic preservation organizations
- Engineering backgrounds
- Economic backgrounds
- Canada

The first meeting of the Committee was held February 29, 2000 through March 2, 2000 in Kalispell, Montana. This meeting developed an understanding of the project and helped establish the process for the project. The second Committee meeting was held September 25, 2000 through September 27, 2000 in West Glacier, Montana. This meeting reviewed work-to-date and provided input into the engineering and socioeconomic analysis. The third meeting of the Committee is scheduled for September 19 through 21, 2001 and is expected to result in advisory recommendations to the NPS regarding rehabilitation of the Road.

After receiving the recommendations from the Committee, the NPS will develop alternatives for the rehabilitation of the Road. These will form the basis for a Draft Environmental Impact Statement (DEIS). The DEIS will be released for public review and comment. Public comments will be addressed in a Final EIS, which will also be

released for public review and comment. Next, a Record of Decision (ROD) will be prepared by the NPS wherein the decision on how the Road will be rehabilitated will be set forth. This engineering report is not a decision document, but rather an informational report to assist with getting the decision process started.